GEOGRAPHIC SCHOOL BULLETINS

THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

VOLUME 37, NUMBER 16, FEBRUARY 2, 1959 . . . *To Know This World, Its Life*

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

SMILING Turkish couples swing through a folk dance at Çorum near modern Ankara

► Turkey Bridges Two Worlds
► Hardy Lichens Build Soil
► Fishing Through the Ice
► Diamonds Spark Romance, Industry
► The Grandeur That Was Rome

UMI

MAYNARD OWEN WILLIAMS

SILKY-COATED Angora goats, native to Asia Minor, supply mohair. Below, oxen thresh grain in the old way beside Mount Ararat, traditional landing place of Noah's Ark.

ruled and Crusaders battled for entry to the Holy Land. The revolution in 1922 turned a hodgepodge of a nation—part of it lies in Europe, part in Asia—into a modern, nationalistic country.

Ahmet's son, far from being uneducated, went to the new village school where he learned to read and write the new Turkish language. The boy studied subjects his father never heard of—biology, history, and mathematics.

In İstanbul, the young man will exchange his pantaloons and blouse for a grey business suit. He will work in an office and live in a modern apartment house. He will take a wife who will also work in an office. In the new Turkey no field is closed to a woman. She may be a lawyer, doctor, chemist, even a

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

member of congress. Most young women have never known the custom of veiling their faces nor have worn the loose, baggy pants of the older generation. They go to fashion shows, curl their hair, and eat in restaurants with men.

Change has not been limited to the city. Even the fields around the old peasant's village are changing. Fewer and fewer are the homemade plows. Tractor-pulled steel plows dot the countryside. Threshers and combines appear at harvest time.

From newspapers that visitors bring into the village Ahmet hears reports of crops

UMI

DAVID S. BOYER, NATIONAL GEOGRAPHIC STAFF

The Two Worlds of Ahmet

AHMET USKUDAR, weather-tanned and white-haired, waves his cap until the bus disappears down a dusty Anatolian road. The old peasant is waving goodbye to his son who is leaving for Istanbul (above). In so doing, he is saying farewell to the old Turkey he has known and is whole-heartedly joining hands with the new.

The time is past when Ahmet would expect his son to grow up to be a farmer like himself, wearing the pantaloons and bright cloth blouse of the peasant and following him to daily prayers at the call of the muezzin from the mosque.

However, three-quarters of Turkey's 25 million people still make their living, like Ahmet, from the land. Many of them live in the south, along the Mediterranean, where climate allows figs, olives, grapes, filbert nuts, wheat, barley, oats, and tobacco to grow. Others dwell in Ahmet's own Anatolia, the large section of central Turkey closely resembling Russia's steppes. On the dry, fallow land herdsmen tend goats, sheep, and cattle and a few farmers grow wheat.

From his father Ahmet long ago learned how to make the lean land yield wheat. He built his own wooden plow, the way Anatolians have been making plows for more than 3,000 years. His wife works by his side in the fields. Home is a rough stone hut, like the rough stone huts of his neighbors and ancestors.

Ahmet is both superstitious and religious. His oxen carry red cloth to ward off the Evil Eye but he prays five times a day. His wife, following the teaching of Mohammed, still wears her veil before strangers although the government has ordered unveiling.

But all this is changing. Progress pointed its finger at Turkey a generation ago. There now is a modern European-style democracy where once pleasure-loving sultans

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CHARLES E. MOHR

LICHENS

These Hardy Soil Builders Might Even Exist on Mars

OF ALL the kinds of plants, lichens can be safely voted "most likely to succeed."

They live almost everywhere—from steaming tropics to Antarctic mountains, where they are frozen 51 weeks a year. Some astronomers believe they (or similar plants) even survive the pitiless weather on Mars, and account for the greenish areas of that planet.

On earth, lichens (pronounced *like*-ens) thrive on solid stone and thin air. The yellow species bearding tree trunks in the Lassen Volcanic National Park, California (left), does not suck sap or feed on bark. It gets food and moisture from the atmosphere.

Lichens often appear as gray or green splotches on rocks or logs. Some of the 10,000 species resemble tiny cups, stags' antlers, or matchsticks.

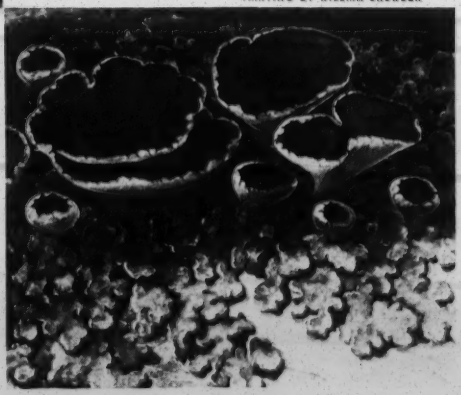
Instead of depending on soil, lichens help make it. With powerful acids they etch away the stone. They trap and hold windborne dust. Over decades pioneer lichens slowly form a carpet of earth that can support mosses, grasses, woody plants.

Men have eaten some species (others are poisonous) since early times. Botanists believe the Biblical manna gathered by the Israelites was a lichen. Tribes around the Eastern Mediterranean still grind it into flour to bake bread.

Red and blue dye can be made from the versatile plants, as well as starch for pastry, perfume and cosmetic ingredients, and some medicines.

The plant itself is a partnership between two entirely different plants, a fungus and an alga. The fungus has no chlorophyll to produce food from sunlight and air. Algae imbedded inside provide it. In return, the fungus protects the fragile alga cells, absorbs water for them, and gains a foothold on the rock where the alga could not survive.

PAINTING BY WILLIAM CROWDER



ELFIN-CUP LICHEN, one of the most abundant along the roadside in temperate climates, is shown here enlarged about 5 times. Its gray-green patches show up most conspicuously in wet weather. Lichens are an important food source for tundra animals.

ARTHUR P. MILLER, JR., NATIONAL GEOGRAPHIC STAFF

NEW AND OLD compete in Izmir, Turkey's third largest city. Passing a Singer sewing machine sign in the background, a farmer returns to the hills after selling his produce. His transportation is a brightly painted wagon pulled by the nation's most common power: the horse.

Below, workers thread green tobacco leaves to be cured in the sun. Tobacco is one of Turkey's chief exports.

and products. Turkey is the world's largest exporter of figs and the biggest producer of filbert nuts. The nation has a monopoly on the world market for meerschaum and emery. It is the leading exporter of chromium. It makes enough money to import the machinery to convert a primarily agricultural country to a combination agricultural and industrial nation.

Paved roads replace horse and camel paths; railroads connect every important town; a network of airways grows.

Turkey has almost forgotten the sad days when it was described as "the sick man of Europe." In 1566 the Ottoman Empire covered almost two million square miles. After World War I, it dwindled to its present 296,000 square miles—about the size of Texas and West Virginia combined—but became a truly unified nation. Today Turkey's fearless standing army and reserves are bolstered by American arms, equipment, and training. A full member of NATO and the United Nations, Turkey keeps a wary eye on Russia, its giant neighbor which has always coveted İstanbul as a gateway to the Mediterranean. The new Turkey is an important eastern bastion of the Free World.

W. ROBERT MOORE, NATIONAL GEOGRAPHIC STAFF

As the dust settles and the bus carrying his son disappears, Ahmet ponders these things, shakes his head, and reassures himself with a glance at the tall thin minarets of the ancient village mosque.

Where Hittite, Greek, Roman, Byzantine, and Turk ravaged and then built empires over the last 3,000 years, once again, "the old order changeth, yielding place to new." L.B.

DWIGHT MILLER, MINNEAPOLIS STAR AND TRIBUNE

PIKE BELOW! A tense fisherman aims the instant the silvery fish swims toward his live minnow bait. A second later the razor-sharp spear strikes between gills and dorsal fin—and the pike is paralyzed. If the fisherman misses his mark, he'll have a terrific fight on his hands, for a wounded fish is a powerful loser.

This Minnesotan chops through 32 inches of steel-hard ice with a long-handled chisel before reaching free water. Then he drags his shanty over the hole and waits.

MANY DEEP-FREEZE anglers catch more fish through the ice than spring and summer fishermen. Walleyes, crappies, sunfish, and perch school up in large groups in winter. The parka-clad angler below, fishing at Tawas Bay, Michigan, has almost caught his 50-a-day limit of perch.

Perhaps the toughest fishing in North America is at Great Slave Lake, Canada, where men live all winter on the ice to catch trout and pike for New York and Chicago markets. Living in pairs on covered sleighs, they sometimes face temperatures of 50 degrees below zero Fahrenheit. Months pass in near-total darkness.

THOMAS J. ABERCROMBIE, N.G.S. STAFF (ABOVE AND LEFT)

NINETY-EIGHT POUNDS of frozen sturgeon are carried triumphantly by a Winnebago fisherman. More than 100,000 giant sturgeon were caught in this area in a recent year, though on some lakes an angler is allowed only one fish a day. A female the size of this one may hold half a bushel of roe.

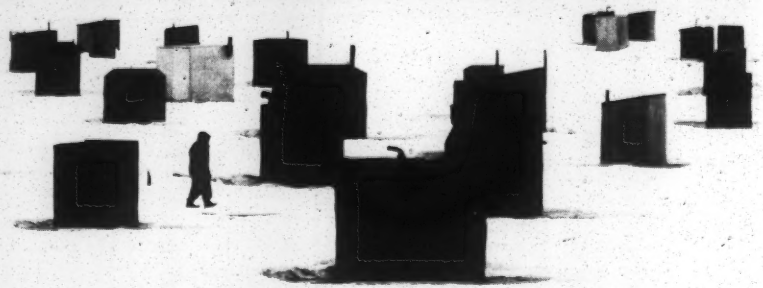
Game wardens patrol the lakes in snowmobiles, skimming up to 60 miles an hour over the ice to keep score on the fishermen and see that their fish are as big as their tales. A sturgeon must measure 30 inches before it is fair game.

Great fish or tiny fish, it's all in a frigid day's fun. As one seasoned fisherman put it, "Fishing is the best sport. Why let winter stop you?" K. C.

Fishing Through the Ice

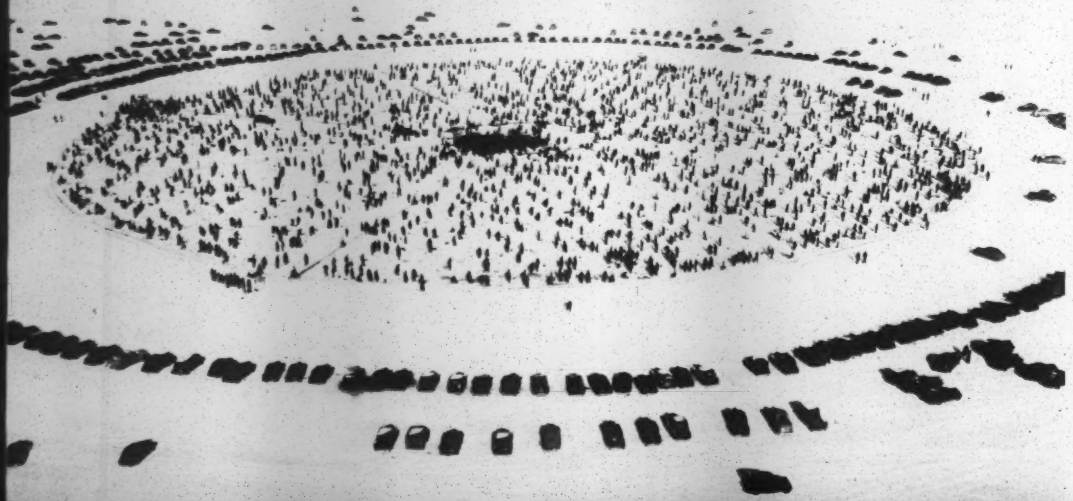
AS THE THERMOMETER slides toward zero, a hardy breed of fishermen takes to the ice. From Long Island's coves west to Michigan, Wisconsin, and Minnesota the frigid sport attracts more and more followers.

From mid-December through mid-March anglers head for the frozen waters, bringing simple, inexpensive gear: a chisel to chop the ice, light line, bait, hook, a "tip-up" to signal fish strikes—and willingness to face wintry blasts.



THOMAS J. ABERCROMBIE, NATIONAL GEOGRAPHIC STAFF

DWIGHT MILLER, MINNEAPOLIS STAR AND TRIBUNE



UNLIKE WARM weather anglers who welcome solitude, winter fishermen love a crowd. An ice-fishing contest on White Bear Lake, Minnesota, left, brings out thousands each year. Along with tackle and high hopes come the family sleds, ice skates, and curling stones.

Many ice fishermen move their sport indoors. Some design their own cabins, complete with chairs, lamps, and bunks, and tow them to the ice by car. The man who doesn't build his own shanty can easily rent one on most lakes.

The lone fisherman carrying his chisel across Lake Winnebago, Wisconsin, above, to join friends in one of the ice shanties will find an oil stove burning, portable radio playing, and perhaps a card game in session. A heavy iron skillet stands ready to grill the tasty catch.

gives an indication of their relative size.

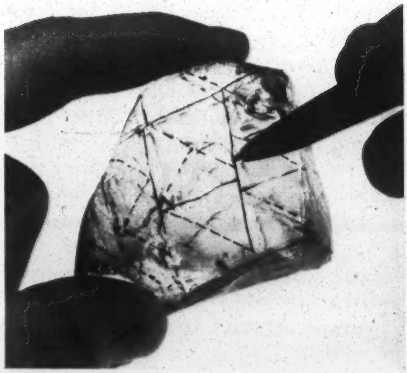
The most familiar diamond shows as a glint on the ring finger of a woman's left hand. But of the five tons of diamonds mined each year, most are not gem quality but workaday tools of industry.

The family automobile runs smoothly, in part, because diamonds polished the piston rings. The gasoline comes from wells drilled by diamond-studded bits. The wire in the ignition system probably was formed by being drawn through a hole in a diamond.

Diamonds slice steel, saw stone, shape bowling balls, polish tooth fillings. Without these hard-working stones, many mass-production processes would stop as surely as if their power were shut off.

In shaping and polishing gem diamonds, diamond dust on the spinning turntable does the cutting—otherwise the gem would slice through the metal wheel as if it were margarine.

Current world production of diamonds would fill about 75 bushel baskets a year. Of these, 73 bushels come from Africa. The Union of South Africa leads all other countries in the value of stones recovered. The Belgian Congo, however, holds the largest known deposits, mostly industrial stones. With demand steadily mounting, sources in Tanganyika, Ghana, Angola, Sierra Leone, French Equatorial and French West Africa are increasingly worked.



Many historic stones came from India, but the mines were emptied by the 18th century. Brazil was a leading producer half a century before the American Revolution. Scattered deposits are still worked there, but their output is small.

In the United States only one deposit of diamond-bearing ore has been found. Near Murfreesboro, Arkansas, some 10,000 rough stones have been taken since 1906. The mine, no longer in operation, allows tourists to prospect for a small fee.

More promising is a man-made "mine" in Detroit, Michigan. There General Electric scientists have succeeded in duplicating the tremendous heat (5,000 degrees Fahrenheit) and pressure (2,400,000 pounds per square inch) of the earth's process of forming diamonds. They put a secret mixture of carbon into their machines and take out made-to-order industrial diamonds. F.S.

PHOTOGRAPHS BY NATIONAL GEOGRAPHIC PHOTOGRAPHER B. ANTHONY STEWART

See Also in the National Geographic: "The Many-Sided Diamond," by George S. Switzer, April, 1958, and "Exploring the World of Gems," by W. F. Foshag, December, 1950. $1 each, postpaid.

UMI

Romantic Diamond Doubles as Laborer

NATIONAL GEOGRAPHIC PHOTOGRAPHER B. ANTHONY STEWART

IT'S JUST CARBON—chemically very similar to soot or the "lead" in your pencil.

But the chunk at right would cost you $2,000,000. It is flawless diamond formed deep in the earth by fantastic heat and squeezing. When it rolled from the ore-crusher at the Premier Mine in Africa's Transvaal, it was a rough rock.

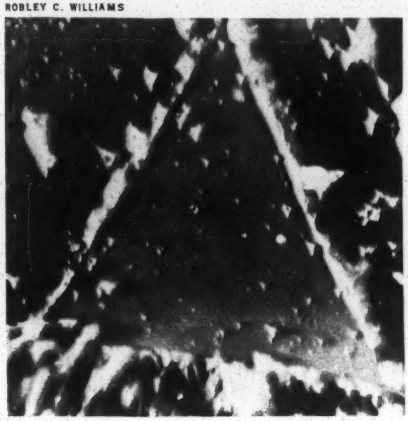
To reveal its icy beauty, Bernard de Haan, shown examining it with his lens, cut and polished it for a year to create the 128-carat Niarchos Diamond, named for the Greek shipowner who bought it.

Transforming bits of rock into bits of beauty ages men before their time. For one thing, diamond is the hardest natural substance known. It will cut any other substance; the strongest acids cannot harm it. Yet if you hit a stone in just the right spot, it will shatter.

Magnified 30,000 times (below) a rough diamond reveals its triangular crystal structure. The electrical bonds holding the carbon atoms together are stronger in certain directions than others. Where they are weakest, a light tap can split the stone.

Before attempting to cut a large stone such as the priceless President Vargas a cutter spends months studying it. The lines drawn on the model, below, on display in the Smithsonian Institution (see GSB Vol. 37, pg. 53-55) show the pattern used to convert the stone into 29 jewels.

ROBLEY C. WILLIAMS



Hitting a multimillion-dollar stone with a hammer and wedge in the hope it will split just right is nerve-wracking. Take the case of J. Asscher, a famed Amsterdam cutter chosen by King Edward VII of Britain to cleave the Cullinan, largest gem diamond ever found.

He studied the fist-sized stone for months. Finally, he made a groove on one edge, placed his wedge, and, sweating freely, brought down the hammer. The wedge broke, but not the diamond. Asscher was carried to the hospital to recuperate.

When his nerves calmed, he tried again. The stone split perfectly—but Asscher didn't know it. At the second his hammer hit the wedge squarely, he fainted into the arms of his doctor.

A glass model of the rough Cullinan and one of the stones cut from it are shown at bottom. A 1¼-carat engagement ring

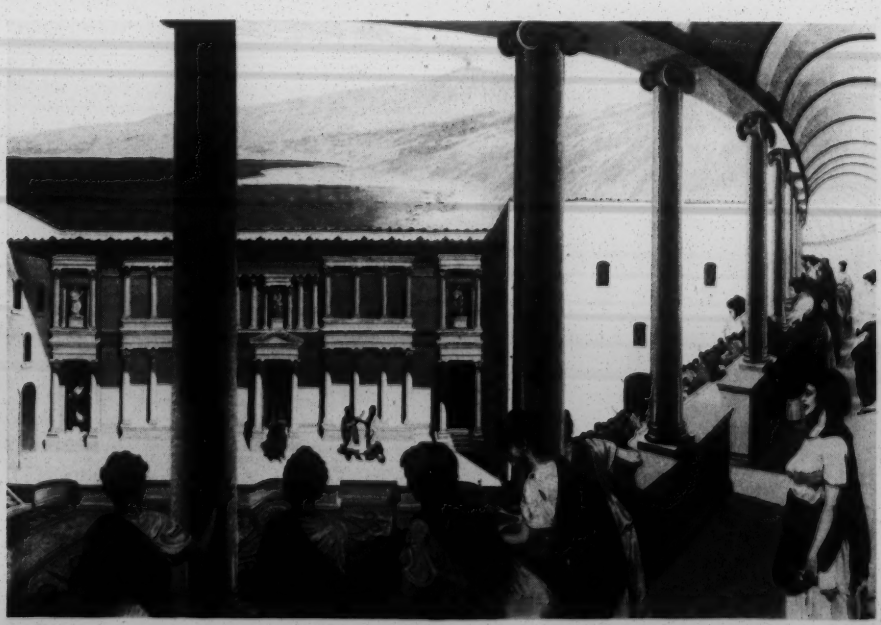
THE POET HORACE greets a friend at his porticoed country villa, where he polished his works. Today's Latin classes still study his carefully chiseled poems. He modestly claimed only that he "played with words on paper," but produced some of Rome's most cultured verse. Noted for his economy of words, Horace warned young writers that "more ought to be scratched out than left."

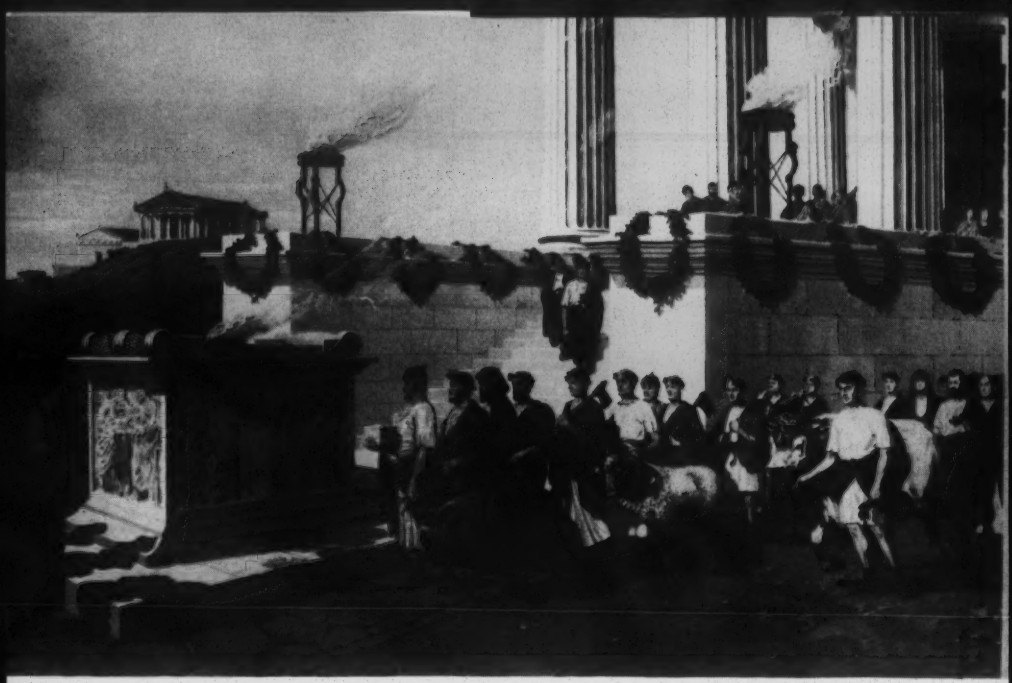
Comedies about family activities give historians valuable clues to everyday life in those ancient times.

Rome's architects bent their talents to create suitable places to stage these dramas. Improving on the Greek amphitheater, they designed enclosed but roofless playhouses. Over the deep stage they suspended a sloping wooden ceiling to serve as a sounding board. So good were the acoustics of these open-air theaters that ladies strolling the gallery could hear every word (below).

Patriotism and politics inspired other kinds of literature. Virgil, Rome's greatest poet, wrote his national epic *Aeneid* to celebrate the glory of Rome and its emperor, Augustus Caesar. The gifted Horace was appointed court poet, given freedom to write whatever he pleased. Cicero, the Winston Churchill of his day, wrote a series of letters and speeches that fascinate students in Latin class today. From a lifetime in public affairs, he distilled wisdom in philosophy, literary works, business, and, above all, politics.

When summer's sun seared Rome's cobbled streets, Cicero and other wealthy gentry beat a path to vacation retreats. The famous man himself owned seven





PAINTINGS BY H. M. HERGET

The Grandeur That Was Rome

WHILE PRIESTS and people wait, animals are led to sacrifice. Incense burning in braziers beside the temple steps scents the air.

Three animals will be slaughtered—indicating that this is an important day in the Roman calendar. Officials have just completed a five-year census of the far-flung empire. To assure continued prosperity, the emperor has ordered sacrifice to the proper gods.

Pig, sheep, and ox come forward. Rules forbid them to be tugged or dragged. They must appear to approach doom of their own accord. Incense and wine will be burned at the altar, the animals sprinkled with salted meal and wine, then slain.

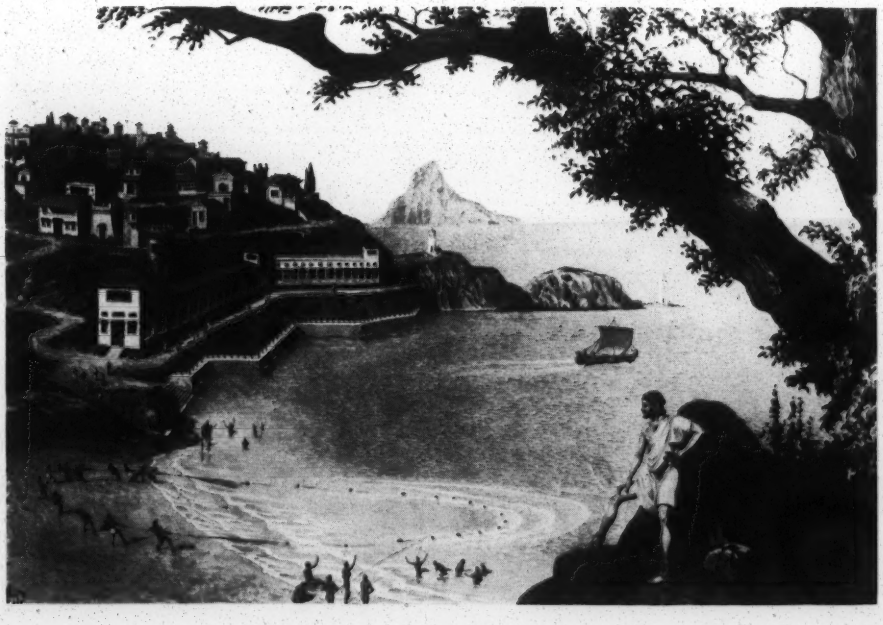
To the practical Romans religion meant a contract between themselves and their gods. Man agreed to observe ceremonies and make offerings in return for divine protection. Priests were appointed by the state to perform rituals and magical acts required to keep the favor of all demons and spirits. On festival days all Romans ceased work.

Rome's rulers had good reason to believe the gods were on their side. Rome of 1900 years ago was the center of an empire that enveloped the entire Mediterranean. By the time of *pax romana,* the peace of Rome, when Augustus Caesar became the first emperor in 27 B. C., conquered lands lay in Europe, Asia, and Africa.

Political and military power brought wealth and leisure to the privileged. Ladies had time to attend the theater where they watched classic Latin comedies from the colonnaded gallery.

Roman drama owed much to the Greek that preceded it. Famous Greek plays were presented in direct translation or adaptation for Latin-speaking audiences. In those parts of the empire where Greek continued to be spoken, Greek tragedies were faithfully reproduced.

But Rome's own literary gifts soon burst into bloom, fed by the exultant spirit of heroic deeds done and great enterprises to come. Oddly enough, the first literary works written for the stage were not martial dramas but comedies. Plautus and Terence wrote comedies from which Shakespeare borrowed. With sharp wit, they punctured many a pretension.



. . . A Spot of Nature's Bounty, 'Twixt Sea and Hill—Statius

villas scattered between Rome and the Bay of Naples. Why so many? Simply because hotels in that day were unknown, taverns unreliable. A well-to-do traveler could use several cottages as resting places along his route. Cicero's villa at Tusculum included baths with warm-water pools, elaborate gardens, rooms for reading, writing, and banqueting.

At Baiae on the Gulf of Naples above, aristocrats built gaily colored cottages of brick and stucco. These were less permanent structures than Horace's country villa with its well-furnished rooms and carefully kept garden. Seaside abodes were inexpensive creations, designed for holiday use by a civilization that knew no resort hotels. From their cottage windows, vacationing Romans could look across the gulf to Capri where Emperor Tiberius built a pretentious palace.

Swathed in white togas, they enjoyed simple pleasures. As in many a Roman town, the bath served as a center of relaxation and discussion for the men. The azure bay beckoned to swimmers and boating enthusiasts. After sundown, a banquet might be in order. Cicero, reflecting every Roman's love of good food and companionship, once wrote: "I love dinner parties. There I can discuss whatever is afoot and turn grumbling into guffaws."

A.P.M.

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